

**From:** [ANDERSON Jim M](#)  
**To:** [Eric Blischke/R10/USEPA/US@EPA](#); [Chip Humphrey/R10/USEPA/US@EPA](#); [Kristine Koch/R10/USEPA/US@EPA](#)  
**Cc:** [MCCLINCY Matt](#); [GAINER Tom](#); [PETERSON Jenn L](#); [POULSEN Mike](#)  
**Subject:** RE: Comments and Proposed RAOs  
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Eric, Chip, & Kristine,  
DEQ reviewed EPA's draft RAO Table & EPA's draft comments on the LWG's 4/24/09 RAO proposal. Both the table & comments were attached to Eric's 5/14 e-mail below. Here are DEQ's comments on the 2 documents.

## EPA's Draft RAO Table

We restricted our comments on this table to the last 2 columns: "Reconciled Potential RAOs" & "Reconciled Supporting Text".

### General Comment

We have 2 main concerns with EPA's Reconciled RAOs. 1<sup>st</sup>, in their current form, RAOs 2 & 5 consider tissue loading from the dietary pathway only..., & do not include tissue loading directly from sediment or surface water. For ecological receptors, this could be interpreted that we are looking separately at unacceptable **direct** contact risk (e.g. benthic toxicity covered in RAO 4) & **indirect** contact risk posed to receptors ingesting contaminated prey (RAO 5). 2<sup>nd</sup>, in their current form, the RAOs may imply that we do not need to reduce sediment, water, & dietary concentrations to be protective of ecological receptor critical tissue levels (levels protective of the organism itself..., fish, bird eggs, etc). Also, RAOs are typically developed for physical media and not biological media. A solution to these concerns could be accomplished by merging RAO 5 back into 4 (sediment & interstitial water) & 6 (surface water)..., & for consistency, merging RAO 2 back into 1 (sediment & interstitial water) & 3 (surface water).

### Specific Comments

#### RAO 1: HH- Sediment & TZW-

- 1) In several places in the Reconciled Supporting Text..., EPA states RAO 1 applies to **direct** human health exposure scenarios. However, **indirect** exposure is included ("ingestion of fish & shellfish") in the Exposure Pathways & Receptors column.
- 2) In the 2<sup>nd</sup> sentence of the Reconciled Supporting Text..., add "*through sediment remedies*" to be consistent with other RAOs.
- 3) In the 2<sup>nd</sup> sentence of the Reconciled Supporting Text..., are we anticipating the LWG will develop human health "*risk-based threshold concentrations*" for TZW in the HH BRA? Or do the anticipated "*risk-based threshold concentrations*" apply to sediment (solid) only? Is there a complete **direct** human health exposure pathway to TZW?
- 4) In the last sentence of the Reconciled Supporting Text..., how will the LWG show that certain COCs pose risk to human health in pore water (see comment directly above)?

#### RAO 3: HH- Surface Water-

- 1) In the 1<sup>st</sup> sentence of the Reconciled Supporting Text..., EPA states RAO 3 applies to **direct** human health exposure scenarios. However, **indirect** exposure is included ("ingestion of fish

& shellfish”) in the Exposure Pathways & Receptors column.

#### RAO 4: Eco- Sediment & TZW-

- 1) In several places in the Reconciled Supporting Text..., EPA states RAO 4 applies to **direct** sediment exposure scenarios. However, ingestion of prey items is included in the Exposure Pathways & Receptors column.
- 2) In the 1<sup>st</sup> sentence of Reconciled Potential RAO..., how does EPA define “risk to the benthic **community**”? Does 1 bioassay hit constitute risk to the benthic **community**? In this question, I’m trying to get to the idea of protection of the population for non-T&E species..., versus protection of individuals for T&E species. How does community relate to population? This issue may be deferred, but will need to be agreed upon sooner or later.
- 3) In the 2<sup>nd</sup> sentence of the Reconciled Supporting Text..., add “*through sediment remedies*” to be consistent with other RAOs.
- 4) In the 1<sup>st</sup> sentence of Reconciled Potential RAO..., add “*amphibians*” & “*shorebirds*” to be consistent with the Exposure Pathways & Receptors column.

#### RAO 5: Eco- Dietary-

- 1) In the 2<sup>nd</sup> sentence of the Reconciled Supporting Text..., change “*humans*” to “*ecological receptors*”.

#### RAO 6- Eco- Surface Water-

- 1) In the 1<sup>st</sup> sentence in the Reconciled Potential RAOs..., add “*invertebrates*” to be consistent with the Exposure Pathways & Receptors column.

### **EPA’s Draft Comments on LWG’s 4/24/09 RAO Proposal**

#### Introduction

- 1) At the end of the 3<sup>rd</sup> paragraph..., I suggest you add..., “*Furthermore, RAOs should encompass situations such as buried sediment contamination covered by relatively clean surface sediment in areas of erosion*”.

#### Definitions

- 1) The last sentence of the definition of “sediment”..., says that riparian soils are being evaluated in the human health & eco risk assessment. Are they?

#### RAOs

- 1) RAO 1: HH- Direct Contact with Sediment- The only place we have TZW data is in areas of suspected/known GW plumes. If EPA defines sediment as solid & TZW & EPA says “*the RAO must include compliance with any identified ARARs for interstitial water*”..., then doesn’t that require the LWG to determine TZW concentrations everywhere..., even outside of GW plumes thru sampling or equilibrium partitioning? This same comment applies to RAO 2, RAO 4, & RAO 6.

#### Management Goals

- 1) Management Goal 1- Close the 2 quotes at the end of the 2<sup>nd</sup> sentence & 2<sup>nd</sup> to the last sentence.

- 2) Management Goal 3- Drop the period & add a space after “(OPA)” in the 3<sup>rd</sup> sentence.
- 3) Footnote 3- Drop the 2<sup>nd</sup> period at the end of the 2<sup>nd</sup> sentence. We generally agree with the last sentence of Footnote 3. In areas of future in-water remediation (dredging, capping &/or MNR), upland sources should be controlled so they do not cause unacceptable risk to river or river-dependent receptors or pose a threat of recontamination to the in-water remedy. In areas where in-water remediation is not planned, upland sources should also be controlled so that they do pose unacceptable risk to river or river-dependent receptors. However, the questions is..., what is the point of compliance? Our position is that these source control goals (& RAOs) should be achieved by at least the point of exposure..., which could be in the biologically active zone, surface sediment, or the water column.

Jim Anderson  
Manager, DEQ Portland Harbor Section  
ph: 503.229.6825  
fax: 503.229.6899  
cell: 971.563.1434

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**From:** Blischke.Eric@epamail.epa.gov [mailto:Blischke.Eric@epamail.epa.gov]  
**Sent:** Thursday, May 14, 2009 4:09 PM  
**To:** Shephard.Burt@epamail.epa.gov; Humphrey.Chip@epamail.epa.gov; Davoli.Dana@epamail.epa.gov; GAINER Tom; Grepo-Grove.Gina@epamail.epa.gov; PETERSON Jenn L; jeremy\_buck@fws.gov; ANDERSON Jim M; Goulet.Joe@epamail.epa.gov; Smith.Judy@epamail.epa.gov; Koch.Kristine@epamail.epa.gov; MCCLINCY Matt; POULSEN Mike; Fuentes.Rene@epamail.epa.gov; Robert.Neely@noaa.gov; Sheldrake.Sea@epamail.epa.gov; tomd@ctsi.nsn.us; csmith@parametrix.com; rgensemer@parametrix.com; rose@yakama.com; erin.madden@gmail.com; jay.field@noaa.gov; Cora.Lori@epamail.epa.gov; Ader.Mark@epamail.epa.gov; audiehuber@ctuir.com; Lisa.Bluelake@grandronde.org; sheila@ridolfi.com; Benjamin Shorr; LavelleJM@cdm.com; Mary.Baker@noaa.gov; Michael.Karnosh@grandronde.org; FARRER David G; dallen@stratusconsulting.com; jpeers@stratusconsulting.com; Bob Dexter; cunninghame@gorge.net; JMalek@parametrix.com; nancy.munn@noaa.gov; Greg.Gervais@noaa.gov; jweis@hk-law.com; Brad Hermanson; frenchrd@cdm.com; ryan@davissudbury.com; Stephen\_Zylstra@fws.gov  
**Cc:** Yamamoto.Deb@epamail.epa.gov; Cox.Michael@epamail.epa.gov  
**Subject:** Comments and Proposed RAOs

Attached is a set of comments on the LWG's April 24, 2009 RAO proposal. I am also attaching a table that compares the latest version of the agency RAOs and supporting text with the LWG proposal. Reconciled Potential RAOs and Supporting Text that serve as the basis for a position back to the LWG are also provided. We can discuss this at the TCT next Wednesday.

Thanks, Eric